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Original Article

Handling of Face Masks by Health-Care Workers during the Coronavirus Pandemic Scare: An Eye-Opener

Abstract

Background: The first case of coronavirus disease 2019 (COVID-19) was reported on January 30, 2020, in India, and it was declared to be a pandemic on March 11, 2020, by the World Health Organization. The use of face masks by the general population and the health-care workers (HCWs) is the most important preventive strategy. **Materials and Methods:** The study aimed to know the knowledge, attitude, and practices of usage and disposal of face masks among HCWs during the COVID-19 pandemic. Data were collected using a peer-reviewed, prevalidated questionnaire. The quantitative variables were described in mean and standard deviation and qualitative variables by number and percentages. $P < 0.05$ was considered statistically significant. **Results:** Nearly 71.43% of the participants were wearing a triple-layered surgical face mask. Almost 48.74% of HCWs were provided with the mask from the place of work. Surprisingly, 56.30% of the HCWs were not changing the mask daily and not following the proper disposal system; moreover, 35.8% of doctors and 64.2% of paramedics were taking the masks back to their homes in their pockets. **Conclusions:** Personal protection equipment started getting scarcely available and was a control item during the hour of this pandemic. This unawareness requires immediate attention, as it poses a high risk for transmission of COVID-19 among Health care service providers.

Keywords: Awareness, coronavirus, COVID-19, eye-opener, face mask, health-care workers, pandemic

Introduction

In 2019 year ending, China testified a large number of pneumonia cases, which were later diagnosed as severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2) on December 31, 2019.^[1] In view of the widespread transmission of coronavirus disease 2019 (COVID-19) worldwide, the World Health Organization declared COVID-19 “a pandemic” on March 11, 2020.^[2] The first case in India was diagnosed on January 30, 2020. This count was on the rise, and the number on May 21, 2020, was 112,359 as per the Ministry of Health and Family Welfare. The virus is transmitted via droplets, from which only the cough etiquette, hand hygiene, social distancing, and personal protective equipment can provide protection.

Health-care workers (HCWs) are at risk of occupational exposure to COVID-19. The emergence of the novel coronavirus 2019 highlighted the importance of identifying infection control measures to mitigate virus

transmission. Apposite protective measures should be implemented to reduce the risk of transmission in health-care settings. The most important prevention strategy is hand hygiene and personal protection, adapting the correct measures. HCWs must be aware of the different measures for their own safety. They should ameliorate the work environment and implement universal precautions and standard measures for disposal of biomedical waste to prevent occupational exposure.

Cognizance of appropriate waste management procedures and occupational safety measures is the backbone of health sector, ensuring patient and staff safety. Health care is a high-risk sector because of the high incidence of diseases due to lack of knowledge or compliance with standard waste management protocols and safety measures.^[3] The role of hospital administration in this regard cannot be overstated, as their actions and inactions endanger the safety of HCW under their care. This study revealed the practices of handling mask in HCWs during the coronavirus outbreak.

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Materials and Methods

This is a descriptive observational study performed in the premises of a tertiary care hospital (hospital setting). The study participants included doctors and paramedical workers working in the tertiary care hospital. All the HCWs involved either in patient care in the wards or in the outpatient departments who were wearing masks were invited to participate in the study. Data were collected using a peer-reviewed, pretested questionnaire consisting of 11 questions. The questionnaire is given in Supplementary Material 1. It was administered to the HCWs over a period of 2 days after taking due clearance from the institutional ethical committee. It was administered by a single researcher to avoid inter-rater bias. The average time taken was 5.2 ± 2.3 s per question. Only those who gave consent were included in the study. The quantitative variables were described in the form of mean and standard deviation and qualitative variable by number and percentages. $P < 0.05$ was considered statistically significant. The data were analyzed using Stata Statistical Software: Release 2013. StataCorp LP, College Station, TX, USA. The study was approved by the institutional ethics committee vide IEC S No: IEC/2020/01 dated April 8, 2020.

Results

A total of 130 HCWs were approached, out of which data were collected from 119 (91.5%) HCWs including doctors, nursing staff, and other paramedics working in a tertiary care hospital directly or indirectly involved in the patient care. The median age of the participants was from 20 to 39 years. The demographic and baseline data are depicted in Table 1.

The type of mask worn by different categories of HCWs is depicted in Figure 1. The majority of the doctors were wearing a triple-layered surgical mask. Nearly 62% (44/71) of the paramedics wore a surgical mask, and rest wore a cloth mask. The cloth mask was majorly purchased from outside. The institution was incapable of providing a cloth

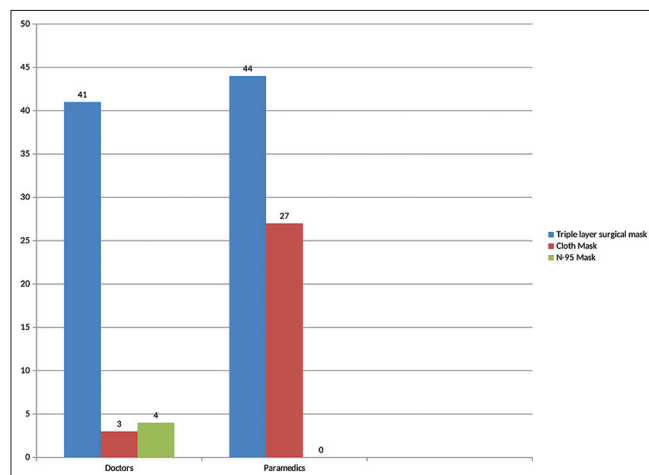


Figure 1: Type of mask used by different health-care workers (n = 119)

mask. Only 20% (6/30) of HCWs wearing cloth masks got it from the institution. The inquiry about the source of the mask revealed that 48.74% (58/119) got the mask from the workplace where they are working, 34.45% (41/119) have to purchase from a pharmacy shop, and 16.81% (20/119) got it managed from somewhere. Surprisingly, the results revealed that 56.30% (67/119) of staff are not changing the mask daily and not following the proper disposal system. Out of this, more surprisingly, 40% (27/67) and 60% (40/67) of the involved are doctors and paramedical staff, respectively, which concerns the awareness among medical professionals.

The data clearly revealed that only 57.14% (68/119) of the respondents had adequate awareness of standard waste management procedures and disposed the mask properly in the yellow container, whereas the other 42.86% (51/119) demonstrated poor or complete lack of knowledge. Nearly 75% (36/48) of the doctors were disposing the mask properly, and only 45% (32/71) of the paramedic staff had proper knowledge of waste management. The details of different mask disposal practices adopted by HCWs are depicted in Figure 2.

A detailed summary of the results is given in Table 2. Nearly 90.76% (108/119) of the participants reused their masks in a single day, out of which, 38.9% (42) were doctors. They were removing it during the ward breaks, lunch breaks, or classes and putting on the same masks after coming back to their respective places of work. The majority of the paramedics 61.1% (66) were also following the same routine, which makes the most worrisome concern. Nearly 47.06% (40/85) of the HCWs using triple-layered surgical masks were not changing their mask

Table 1: Baseline characteristics (n=119)

Variable	n (%)
Sex	
Female	31 (26.05)
Male	88 (73.95)
Designation	
Doctors	48 (40.34)
Paramedics	71 (59.66)
Place of employment	
Sample collection room	16 (13.45)
Emergency room	11 (9.24)
OPD	27 (22.69)
Inpatient wards	65 (54.62)
Type of mask	
Cloth mask	30 (25.21)
N 95	4 (3.36)
Triple-layered surgical mask	85 (71.43)
Mask providers	
Institute	58 (48.74)
Managed from somewhere	20 (16.81)
Procured from private shop	41 (34.45)

OPD: Outpatient department

Table 2: Summary of results

Characteristics	Type of mask (n=119)			P*
	Cloth mask (n=30), n (%)	N-95 (n=4), n (%)	Triple-layered mask (n=85), n (%)	
Place of employment				
Handling samples	3 (10)	0	13 (15.29)	0.000
Involved in screening	19 (63.33)	0	19 (22.35)	
Working in wards	8 (26.67)	4 (100)	53 (62.35)	
Change mask daily				
Yes	6 (20)	1 (25)	45 (52.94)	0.006
No	24 (80)	3 (75)	40 (47.06)	
Take mask to their home in pockets				
Yes	27 (90)	2 (50)	38 (44.71)	0.000
No	3 (10)	2 (50)	47 (55.29)	
Disposal of face mask				
Any dustbin	3 (10)	0	9 (10.59)	0.000
In yellow container as per the BMW guidelines	1 (3.33)	2 (50)	65 (76.47)	
In their bag/vehicle	24 (80)	1 (25)	11 (12.94)	
Leave it anywhere	2 (6.67)	1 (25)	0	
Reuse of mask during the day				
Yes	29 (96.67)	0	75 (88.24)	0.317
No	1 (3.33)	4 (100)	10 (11.76)	
Disinfection of hands after handling the face mask				
Yes	26 (86.67)	3 (75)	80 (94.12)	0.214
No	4 (13.33)	1 (25)	5 (5.88)	

Figure in parentheses indicates percentage, *Significant <0.05. BMW: Biomedical waste

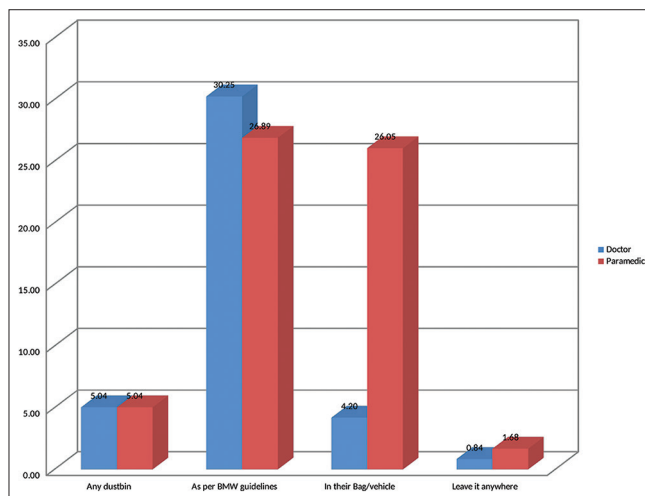


Figure 2: Disposal of face mask by different health-care workers. BMW: Biomedical waste, Numbers indicate percentages

daily, and 44.71% (38/85) of them were taking them to their homes in the pocket.

Discussion

The outbreak of the novel coronavirus in December 2019 has defied the health services worldwide. The health-care system needs to be conscious about the safety of their HCWs as they are at a significant risk of getting infected and also of transmitting the disease to patients. Awareness of the personal protective equipment among HCWs

requires to be evaluated with regard to practicability and effectiveness.

The majority of the HCWs at our center were not aware of the etiquettes to wear a surgical mask or the proper disposal of the masks. This is consistent with the findings of Ozder *et al.*, in Istanbul where HCWs similarly demonstrated lack of knowledge of disposal of medical waste prior to receiving training on waste management.^[4] In a study by Nagaraju *et al.* in India, 24% of the HCWs had the appropriate knowledge.^[5] In their study, 40.3% of the study participants were doctors and are assumed to have had appropriate knowledge of standard hospital waste management. However, only 75% of them knew the proper disposal of the masks. The rest of them were disposing in a wrong way or reusing it again over days; this is alarming considering the high risk and burden of transmission of COVID-19 faced by health-care service providers globally. Thus, proper knowledge of standard waste handling procedure is mandatory to build a safe workplace and environment; people, particularly hospital staff, should be made aware or trained on these procedures, regularly. The majority of the participants, 90.76%, revealed that they reuse their masks in a single day. Almost 88.24% of the HCWs using triple-layered surgical masks were reusing the masks. Such noncompliance with standard precautions was also reported by Kumar *et al.* in Pakistan^[6] and Amosu *et al.* in Nigeria.^[7]

Our study also revealed the shortage of masks of all types and HCWs had to purchase these masks from outside.

The institution could not stand the demand versus supply of the masks to be provided to the staff getting exposed to COVID-19 patients. In a study by Yang *et al.*, 59.8% of the HCWs used a cotton cloth mask as compared to 40.2% of surgical masks.^[8] In contrast to this, in our study 71.43% of the respondents wore a surgical mask, and only 25% wore a cotton cloth mask. Oliveira *et al.* in their study showed that nonadherence with standard precautions was more likely in settings with unskilled workers.^[9] In our study, the HCWs were not given any formal training sessions and were assumed to be working in the hospital settings with a basic understanding of the proper handling and disposal of the face masks. However, the study analysis revealed that there is an urgent need to review the knowledge practices of the HCWs at our center.

Moreover, this study highlighted the lack of supervision by relevant safety regulation agencies, which should monitor the standards, ensure strict adherence to safety procedures, and provide technical support. The hierarchy from the top, doctors, nurses, and then the paramedical staff, needs proper supervision and training for the proper use and standard hospital waste management.

Conclusions

This study revealed the inadequate knowledge and noncompliance to standard waste management protocols by the HCWs. It demonstrated the lack of regular training on workplace safety measures. The lack of monitoring and regulation over the staff handling and disposing the biomedical waste was also noted. There is an urgent need to update the knowledge of our own staff to prevent the spread of infection.

We, therefore, recommend for planned, regularized training and re-training of HCWs on the standards of biomedical waste management and occupational safety protocols. It is required to revise our existing policies and their strong implementation for the training of the staff in health-care settings. We also recommend that the government regulatory bodies strictly ensure the adoption of the standard safety measures at the medical centers and have a regular check on these policies.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Supplementary

Supplementary Material 1

Questionnaire: Mask management by health-care workers during the coronavirus pandemic scare

1. What is your age?
 - a. 20–29 years
 - b. 30–39 years
 - c. 40–49 years
 - d. 50–59 years
 2. What is your gender?
 - a. Male
 - b. Female
 3. Where are you employed?
 - a. Screening of individuals at OPD/entry gates, not coming in direct contact of patient (contact = involved in touching or examination of the patient)
 - b. Working in the ward and coming in direct contact with the patient
 - c. Screening in the OPD and coming in direct contact with the patient
 - d. Involved in handling samples.
 4. Your designation?
 - a. Doctor
 - b. Paramedic (includes nursing officer, nursing assistant, ambulance drivers, lab technician)
 5. What type of mask you are wearing?*
- a. Triple-layered surgical mask
- b. Cloth mask
- c. N95 mask
6. Who provided you the mask?
 - a. Institute where you are working
 - b. Self-purchased
 - c. Managed from somewhere
7. Do you change your mask daily?
 - a. Yes
 - b. No
8. Do you take your mask to your home in your pocket?
 - a. Yes
 - b. No
10. Where do you dispose off your mask?
 - a. In yellow container of biomedical waste
 - b. Any dustbin
 - c. In your bag/vehicle
 - d. Leave it anywhere
11. Do you reuse your mask during the day?
 - a. Yes
 - b. No
12. Do you disinfect your hands with alcohol-based hand rub/wash hands after you touch your mask?
 - a. Yes
 - b. No